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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/744,227 | 01/22/2001 | Hidetaka Higashino | NAK1-BN65 | 3963 |

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03/05/2003

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EXAMINER

DONG, DALEI

ART UNIT

PAPER NUMBER

2875

DATE MAILED: 03/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/744,227

Applicant(s)

HIGASHINO ET AL.

Examiner

Dalei Dong

Art Unit

2875

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 22 January 2001.

2a) ☐ This action is **FINAL**.

2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-49 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1-49 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 22 January 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☒ All b) ☐ Some * c) ☐ None of:

1. ☒ Certified copies of the priority documents have been received.

2. ☒ Certified copies of the priority documents have been received in Application No. 09/744,227.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____

4) ☐ Interview Summary (PTO-413) Paper No(s) _____

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other.

DETAILED ACTION

Drawings

1. Figure 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 5-6, 9-10, 13-14 and 41-49 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,938,494 to Betsui in view of U.S. Patent No. 6,236,159 to Inoue.

Regarding to claims 1-2, 5-6, 9-10, 13-14 and 41-49, Betsui discloses in Figures 3-4C, a "pair of substrates may be composed of a front substrate and a rear substrate. These substrates may be made of glass" (column 3, line 3-5).

Betsui also discloses in Figures 3-4C, "as the sealing medium used for sealing the periphery of the substrates for assembling the panel, usable are low-melting glass and various kinds of organic materials" (column 3, line 28-30).

Betsui further discloses in Figures 3-4C, "the removal of the temporary protective film may be carried out by introducing a gas for electric discharge for removal into the discharge space between the pair of substrates, and then applying voltage to generate electric discharge between the electrodes to etch the temporary protective film" (column 3, line 31-37).

Betsui further yet discloses in Figures 3-4C, "after the removal of the temporary protective film, the discharge gas for removal is taken out from the inside of the panel and then the discharge gas for display is introduced into the panel. This discharge gas for display is to be used when the panel is used as a finished product. Alternatively, a getter may be provided in the panel, and the discharge gases for display and for removal of the temporary protective film by electric charge, the getter is activated to remove the discharge gas for removal contained from the inside of the panel" (column 3, line 41-51).

However, Betsui does not disclose a partition walls and the substeps for the exhaust step specified in the limitations. Inoue teaches, "after fabrication of the panel, an evacuation and gas introduction process is performed in the following manner. The panel is evacuated from at least one or the vent holes. The impurity gases are caused to be released from the barrier ribs, the sealing member and the like in the panel and expelled from the inter-rib spaces by some means. The release of the impurity gases may be achieved, for example, by heating the panel or by causing electric discharge between discharge electrodes or between the cleaning electrodes while introducing the gas into the panel. These methods may be employed in the combination" (column 6, line 66-67 to column 7, line 1-9).

Inoue also teaches "the impurity gases remaining in the inter-rib spaces within the panel are forcibly expelled from the second vent hole by introducing the discharge gas or the cleaning gas, e.g., N_2 , Ne, He, Ar or gas mixture thereof, into the panel from the first vent hole. Alternatively, the impurity gases may be removed from the inter-rib spaces by guiding the impurity gases to the getter to allow the getter to absorb the impurity gases. Thereafter, the introduction of the gas is stopped, while the panel is continuously evacuated. This operation may be repeated several times as required" (column 7, line 10-19).

Inoue further teaches, "the panel is cooled to room temperature, and the evacuation is stopped. Then, the discharge gas is introduced into the panel until the internal pressure of the panel reaches a desired level, and the vent pipes attached to the panel is sealed" (column 7, line 20-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the gas flow barrier along with the evacuation and gas introduction process of Inoue for the manufacturing process of a gas discharge panel of Betsui in order to ensure complete removal of impurity gases in inter-rib spaces of the panel by providing a gas flow barrier in a peripheral space of the panel to allow the inter-rib spaces to have a greater gas flow conductance than the peripheral space.

5. Claims 3-4, 7-8, 11-12, 15-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,938,494 to Betsui in view of U.S. Patent No. 6,236,159 to Inoue in further view of U.S. Patent No. 6,332,821 to Park.

Regarding to claims 3-4, 7-8, 11-12, 15-20 and 33-40, Betsui discloses a method of producing a gas discharge panel comprising an envelope forming step for forming an envelope by providing over a first plate a second plate so the second plate faces a main surface of the first plate, a sealing step for sealing the envelope with a sealant along outer edges of the first and second plates, an exhaust step for exhausting gas from the envelope and a filling step for filling the envelope with a discharge gas.

However, Betsui does not disclose partition walls for partitioning light emitting cells and the exhaust substeps specified in the limitation and a pressure in the envelope is set lower than a pressure outside the envelope. Inoue teaches a partition walls and the exhaust steps including a substep for evacuating the envelope; a substep for filling the envelope with a cleaning gas and a substep for re-evacuating the envelope.

However, Inoue fails to teach a pressure in the envelope is set lower than a pressure outside the envelope. Park teaches "the exhaustion of air within both the assembly 20 itself and the heating chamber 31 is carried out via the piping 33 and 33' simultaneously. At this time, the first, second and fourth valves 34, 35 and 37 are opened and the third valve 36 is closed. When the air begins to evacuated, the heating chamber 31 begins to be heated by the heater 30 simultaneously. The temperature of the heating chamber 31 is raised to 400° C.-450°C. by heating" (column 5, line 4-10).

Park also teaches, "when such evacuation and heating is carried out simultaneously, the frit glass 23 begins to melt at a temperature above 400°C. In addition, gases are generated from the frit glass 23, and such gases are exhausted out of the heating chamber 31 by the evacuation operation. The frit glass 23 melts between the substrate 11 and 12, and accordingly the substrate 11 and 12 are bonded by the pressure of the clips. At this time, the thickness of the frit glass 23 become thinner than the initial thickness, and consequently the partition walls 17 can closely contact the inner surface of the facing substrate 11" (column 5, line 11-21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the gas flow barrier along with the evacuation and gas introduction process of Inoue and the exhaustion of air within assembly of Park for the manufacturing process of a gas discharge panel of Betsui in order to ensure complete removal of impurity gases in inter-rib spaces of the panel by providing a gas flow barrier in a peripheral space of the panel to allow the inter-rib spaces to have a greater gas flow

conductance than the peripheral space and thus provide an improved method for fabricating a plasma display device.

Regarding to claims 21-32, Betsui discloses a method of producing a gas discharge panel comprising an envelope forming step for forming an envelope by providing over a first plate a second plate so the second plate faces a main surface of the first plate, a sealing step for sealing the envelope with a sealant along outer edges of the first and second plates, an exhaust step for exhausting gas from the envelope and a filling step for filling the envelope with a discharge gas.

However, Betsui does not disclose partition walls for partitioning light emitting cells and the exhaust substeps specified in the limitation and a pressure in the envelope is set lower than a pressure outside the envelope while a dry gas is circulated through the envelope. Inoue teaches a partition walls and the exhaust steps including a substep for evacuating the envelope; a substep for filling the envelope with a cleaning gas and a substep for re-evacuating the envelope.

However, Inoue fails to teach a pressure in the envelope is set lower than a pressure outside the envelope while a dry gas is circulated through envelope. Park teaches "the exhaustion of air within both the assembly 20 in itself and the heating chamber 31 is carried out via the piping 33 and the piping 33' simultaneously. At this time, the heating chamber 31 begins to be heated by the heater 30 simultaneously with the evacuation. The temperature of the heating chamber 31 is raised to 400.degree. C. - 450.degree. C. by heating. The frit glass 23 is melted by heating, and accordingly the

substrates 11 and 12 are bonded. Gases are generated from the frit glass 23, and such gases are exhausted out of the heating chamber 31 by the evacuation operation" (column 6, line 19-28).

Park also teaches "then, when the device and chamber are cooled down to the first predetermined temperature, the evacuation of the heating chamber 31 and the assembly 20 is stopped, and the discharge gas is supplied to the assembly 20. It is preferable that the discharge gas be an inert rare gas, Ar or Ne, and the gas filling pressure is in the range of from 10 to 760 Torr" (column 6, line 29-34).

Park further teaches, "when the pressure of the discharge gas in the assembly reaches a predetermined pressure, the assembly 20 is evacuated again. It is preferable that such evacuation and filling of the discharge gas is repeated more than twice. It is effective for exhausting air and moisture remaining within the assembly 20 that the discharge gas is repeatedly filled and evacuated in a high temperature state" (column 6, 35-41).

Park further yet teaches, "after the above steps are finished, the assembly 20 and the heating chamber 31 are further cooled. The cooling is continued until the temperature of the assembly 20 reaches the second predetermined temperature in the range of 10.degree. C. to 100.degree. C., and it is preferable that the assembly 20 be cooled to room temperature. When the assembly 20 is cooled to the second predetermined temperature, another charge of the discharge gas is supplied to the assembly 20 to 100-700 Torr. After the discharge gas is supplied as above, the vent hole 21 is sealed to complete the display device assembly" (column 6, line 42-52).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the gas flow barrier along with the evacuation and gas introduction process of Inoue and the exhaustion of air within assembly of Park for the manufacturing process of a gas discharge panel of Betsui in order to ensure complete removal of impurity gases in inter-rib spaces of the panel by providing a gas flow barrier in a peripheral space of the panel to allow the inter-rib spaces to have a greater gas flow conductance than the peripheral space and thus provide an improved method for fabricating a plasma display device.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following prior art are stated to further show the state of the art of a method of producing a gas discharge panel.

U.S. Patent No. 5,207,607 to Nagano.

U.S. Patent No. 5,956,003 to Fisher.

U.S. Patent No. 6,172,460 to Damen.

U.S. Patent No. 6,439,943 to Aoki.

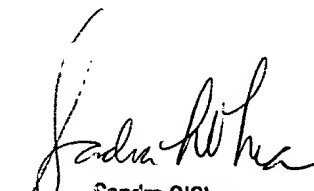
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9318 for regular communications and (703)872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.
February 21, 2003


Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800